2

Explaining Cellular Phenomena through Mechanisms

> I do not in the least mean by this that our faith in mechanistic methods and conceptions is shaken. It is by following precisely these methods and conceptions that observation and experiment are every day enlarging our knowledge of colloidal systems, lifeless and living. Who will set a limit to their future progress? But I am not speaking of tomorrow but of today; and the mechanist should not deceive himself in regard to the magnitude of the task that still lies before him. Perhaps, indeed, a day may come (and here I use the words of Professor Troland) when we may be able 'to show how in accordance with recognized principles of physics a complex of specific, autocatalytic, colloidal particles in the germ cell can engineer the construction of a vertebrate organism'; but assuredly that day is not yet within sight of our most powerful telescopes. Shall we then join hands with the neovitalists in referring the unifying and regulatory principle to the operation of an unknown power, a directive force, an archaeus, an entelechy, or a soul? Yes, if we are ready to abandon the problem and have done with it once and for all. No, a thousand times, if we hope really to advance our understanding of the living organism.
>
> (Wilson, 1923, p. 46)

The focus of this book is creation of cell biology in the mid-twentieth century as a distinct field of biology devoted to discovering and understanding the mechanisms that account for the ability of cells to live. The notion of mechanism has a long history in philosophy (a brief sketch follows), but it was largely eclipsed in twentieth-century philosophy of science, which emphasized laws and, not coincidentally, physics rather than biology. Mechanisms have begun again to be the focus of discussion in very recent philosophy of science. I will devote a major portion of this chapter to discussing the central features of this newly emerging conception of mechanism and mechanistic explanation. While many of the philosophers advancing this notion of mechanism have

https://doi.org/10.1017/CBO9781139164962.003 Published online by Cambridge University Press